PART 2-KEYNOTE LUNCHEON SPEECHES

HOV as a System-Wide Solution

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It is a pleasure to participate in the Seventh National HOV Conference here in Los Angeles. I bring greetings from the home of the next NBA Champions-the Houston Rockets. The community pride in the Houston area has been very evident during the basketball playoffs. Although Metropolitan Transit Authority of Harris County (METRO) does not allow any advertising on our buses, a METRO bus has been painted with "Go Rockets." Free rides are currently being provided on this bus.

Los Angeles is a great location for the conference. There are a number of similarities between the HOV facilities in Houston and Los Angeles. Both represent coordinated and cooperative efforts between numerous groups. The HOV lanes in Houston have been developed-and continue to be operated-through the-joint efforts of METRO and the Texas Department of Transportation (TxDOT).

The HOV lanes in Houston represent a basic element of the mass transit system and are a major part of the overall transportation system. How Houston got to this point was not necessarily a well planned route, however. Rather, it brings to mind an anecdote about Bishop Fulton J. Sheen.

Some of you may remember that back in the 1950s and 1960s, Bishop Fulton J. Sheen was a great moral force in the United States. He had a program on television that was broadcast nationwide, and he traveled all over the world presenting inspirational talks.

One evening in Philadelphia, Bishop Sheen decided to walk from his hotel to the Philadelphia Town Hall even though he was unfamiliar with the city, Sure enough, he became lost and was forced to ask some boys to direct him to his destination.

One of them asked Sheen, "What are you going to do at Town Hall?" Sheen replied, "I'm going to give a lecture." "What about?" the boy asked. "On how to get to heaven. Would you care to come along?" "Are you kidding?" said the boy, "You don't even know how to get to Town Hall!"

It would be terrific for me to be able to tell you that Houston public transportation planers knew from the start how high occupancy vehicle lanes would be used to provide a system-wide solution to our transportation problems. However, like Bishop Sheen, although we knew our ultimate destination, we did not know the route we were going to take to get there.

A brochure produced in 1978 illustrated the route METRO planned to take when it was created as a brand new transit authority in Houston, Texas. The brochure shows an artist's conception of four steps in Houston's public transportation future.

The first picture is of a congested freeway; which was certainly the state of Houston traffic in 1978. The next frame shows a dedicated busway down the middle of that freeway. The third picture shows construction taking place on the busway, and the fourth picture shows a rail line in place of the busway.

Well, we have not gotten to the rail line yet because a funny thing happened on the way to the train. Our busways turned into an HOV lane network, and we realized we had a successful transportation system on our hands.

Once we realized that, we made managing the assets of the HOV lanes a major part of the system-wide solution for Houston's traffic problems. We have had quite a bit of success doing that. According to the Texas Transportation Institute, Houston is the only major city in the country which has had continuously declining congestion levels since 1984.

Here's the route we took to our version of "transportation heaven"-our 64 mile, and soon to be 104 mile-barrier separated HOV lane network.

What we only recently decided to call "High Occupancy Vehicle" lanes were at first simply "contra-flow" lanes. They then became barrier separated "Authorized Vehicle Lanes," or "Transitways." These lanes were mainly seen as effective mass transit techniques-but not "the system-wide solution" to traffic management.

Houstonians like their cars and pickups, and many think they have a right to their single occupant vehicles. These independent folks were somewhat hostile to the first

contraflow lane because it took an existing lane of freeway, in the off-peak direction of travel, and restricted its use to buses and vanpools.

The citizens trapped in traffic alongside the HOV lanes did not interpret the intermittent buses or large vans flying past them as 47-less-cars-blocking-their-way. They thought they saw under utilization of these transit lanes. And they complained so loudly that we began to allow carpools to enter these previously transit-only lanes.

At first, we had all kinds of restrictions. Drivers had to go through a training course, display an authorized user tag, and ferry at least three passengers in addition to the driver. Needless to say, Houstonians remained hostile. They knew how to drive, and they cherish their privacy. Until we lowered the occupancy minimum to two persons, few carpools used the HOV lanes. When we finally dropped the training requirement and let any two persons brave enough to figure out how to get on the lane try the "transitways," the HOV lanes very quickly became as popular as sliced bread.

Thus, we backed into using our transitways as true HOV lanes because of public opinion. Meanwhile, the cost of building a train system, and the political problems attendant with both the cost and possible locations took a toll on public opinion. Not-in-my-backyard attitudes toward train building had a lot to do with the utilization of a freeway-based HOV lane system.

Since we were a new agency, and we were seeking federal funds, Houston METRO held two areawide referenda that solicited citizen input on the locally preferred transit system technology. In a 1993 election, heavy rail got soundly trounced.

We conducted a lot of surveys and public opinion polls in the mid-1980s, and in 1988, we ran the issue up the flagpole again. This time the vote indicated strong support for dedicating 25 percent of our sales tax to street construction and maintenance of traffic management in general. This is when METRO really became a different type of transit authority and really became a serious transportation agency. It also looked like there was support for rail technology in the form of a loop connector fed by a bus system that added to the HOV system, rather than replacing it.

We were, at this time, beginning to get federal appropriations for our system as well. The following sequence of events took place over the next tive years:

- the board changed, and rail was dropped;

- the board changed again, and a new rail plan was developed and adopted;

- the mayor and the board changed, and rail was dropped again.

The current Board of Directors took a good look at Houston's transportation assets, including the HOV lanes, and, realizing the treasure we had in them, decided that Houston should stick with and expand on our state-of-the-art bus system and run it on HOV lanes wherever and for as long as that makes sense. We were successful in getting approval to keep and continue the federal funding program on the basis that our HOV lanes were still fixed guideways. We named our system-wide solution "The Regional Bus Plan. "

Of course what I have just told you is a very simplified version of a very complex fifteen years of existence. Even today, there are some who say that HOV lanes are not legitimately fixed-guideway transit systems. I would argue that it is exactly the sort of intermodal system that ISTEA was formulated to encourage.

Let us look at the bus aspect of the system first. Buses make great sense in cities like Houston for two major reasons: we have a very large service area, 1,279 square miles, and comparatively low densities. In fact, every corridor in Houston that could justify rail has an HOV lane either in operation or under design. Houston has no natural barriers like oceans or mountains to contain its growth, so it just spreads across on the coastal plain like cattle looking for fresh grass.

Also, for better or worse, Houston is the last large American city without zoning. We thought last year that we might get zoning, but our citizens voted it down still one more time. So planning and channeling development is very hard to do in a city like ours. This makes a flexible transportation system essential if we are to respond to the needs of our growing city.

More and more, Houston is becoming-as Joel Garreau says-a collection of ***Edge Cities.*** Our central business district, while still the major employment center, is being challenged by numerous other employment nodes such as the Texas Medical Center and The Galleria/Uptown area. These are just two of about twelve areas that are attracting employees away from the central core. Three of these major activity centers alone are in the nation's top twenty employment districts today.

Thus, Houston is like most other large cities in the world. The central business district is no longer the only employment center. This suburbanization of work locations creates problems for transportation geared to hub-and-spoke systems which are typified by the rail systems of older cities.

Our large interconnecting freeway system has already laced these employment centers together, so using the freeway HOV lanes for buses makes, good sense for Houston. Our park-and-ride system brings the workers directly to the large major activity centers, or drops them

off at transit centers to make transfers to other suburban locations. Bus riders who make the trip all the way to a major activity center on one bus are dropped off close to their buildings.

One of the many issues associated with a possible rail system in Houston is how it compares with the effectiveness of the park-and-ride bus system as far as collecting and distributing riders. This, of course, is on top of the fact that the average park-and-ride bus speed is twice that of the average rail line, plus park-and-ride service is already very cost efficient.

All of the rail systems evaluated in Houston have presented problems when factoring in distribution of passengers from the central train station onto buses for delivery to the downtown office buildings. Riders' trips become longer if they have to change modes. This challenge may not be formidable in cities with long-established intermodal transit systems, but Houstonians have never been substantial users of public transit, so we are constantly competing with the automobile for their business.

Distribution problems become much smaller when the transportation system is comprised of buses and carpools because they are much more flexible. Flexibility is the key word when dealing with low density areas. HOV lanes amplify the flexibility needed.

There are, of course, planning challenges to the effective use of HOV lanes. Finding the right mix of vehicles, hours of operation, number of passengers, and safety has not been easy. I have already told you that we started out requiring four persons with a trained driver and an authorization card, then we dropped to two persons. Once the word got out about what a good deal this was, ridership in carpools increased so rapidly on the I-10 West transitway that we had to raise the occupancy requirements during the peak hours. To keep the HOV lane from clogging up, we require three persons in each car during the morning and afternoon peak hours.

In order to retain our bus passengers, we have to keep the traffic moving swiftly on the HOV lane. Thus, good management and monitoring of the traffic flow is essential. Currently, we are very close to raising the occupancy levels during the morning peak hour on two other freeway HOV lanes to keep them flowing smoothly.

We have also changed the operating hours for the HOV lanes. Originally, they were only open during the peak hours. Complaints about under-utilization of the lanes led to vastly expanded hours, however. Late in 1993 and early in 1994, three wrong-way incidents occurred on the lanes that lead us to restrict operating hours. The incidents appear to be caused by driver errors. One case might have been the result of two teenagers deliberately going the wrong way with no lights at night playing chicken. Another involved a driver with a blood alcohol content of 0.27 whose entry onto the HOV lane defies any logic and some laws of physics.

We took a number of steps to prevent these types of incidents from occurring again. The entries and exits to the lanes have become more controlled and extra enforcement personnel have been deployed. We also cut back the operating hours initially. Recently we have upgraded our signage and extended the hours again, but not quite as broadly as before.

Over time, we have continued to add to the HOV lane system. Almost 65 miles are currently in operation. An additional 40 miles are under construction or in design. Every time a new lane opens, we see ridership rise dramatically.

Right now, combined with our bus system, our HOV-network carries more passengers than the bus and rail systems of San Diego or Miami or Atlanta. The system operates at a cost-per-passenger mile of about $0.05 per mile.

With this bus-based, HOV-based system, it has become very difficult to justify investing in a rail system. We would invest in rail if and when the HOV system, carefully managed to achieve maximum use of its assets, did not meet Houston's needs any longer.

For example, the HOV lane on which we have already increased the occupancy requirements during peak hours is on one of the most heavily traveled freeways in the Houston region-the one heading from Houston to Austin and San Antonio. There may be a time when we will have to increase the occupancy requirements on this HOV lane to four persons, then go to vans, then go back to buses-only. By that time, demand for capacity will have risen so high that ridership on a rail system parallel to the HOV lane might be economically feasible. If and when that occurs, we will fulfill the promise of our original brochure and install the beginning of a rail system. At the moment and in the foreseeable future, not only is the ridership not there for a rail system, but the HOV lanes also provide other benefits.

Houston's HOV lanes help us comply with ISTEA requirements that high occupancy vehicle facilities must be considered before general purpose freeway lanes are added, even though our HOV lane network was already under construction before that ISTEA ruling came abut.

In Houston, we've found that middle class, inner city neighborhoods and environmental groups would rather have HOV lanes added than double deck or significantly widen our freeways, even though land is available for widening.

The HOV lane alternative also appears to be preferred over a commuter rail line or toll roads down existing freight rail rights-of-way through a major Houston park

and alongside inner-city neighborhoods. So, recent experience indicates that many residents are more open to HOVs than other modes of transportation. Further, while the lower cost of HOV lanes compared to rail makes HOV seem an excellent investment, the fact that HOV rights-of-way can also be utilized as rail lines in the future-if passenger ridership warrants that expense-helps us respond to rail-oriented Houstonians.

Now, I would like to shift gears and address the topic of HOV lanes as a system-wide solution. I would like you to consider your city's total transportation system as a bundle of major assets and talk about asset management for a moment. In "Driving Forces that have Shaped Transportation Demand Management," Tad Widby says, "If most businesses in the United States . . . [wanted] to increase their output . . . they may add a second shift, have one of 'their lesser-used plants produce more product, or take some other action. Few would . . . build a second manufacturing plant. Most, would try to get more productivity from their existing assets. In the transportation field . . . the response to the need to handle more trips has often been to build more capacity rather than to wring more capacity or productivity out of what we already have. ISTEA clearly sets asset management as a fundamental priority. "

In this context, if a total transportation system is looked at as a manufacturing process "one would consider the inputs, the outputs . . . and other aspects to gain greater productivity. Before adding capacity, it is likely that one would consider adding a second shift (spreading the peak), finding more efficient product delivery means (increasing vehicle occupancy), using just-in-time inventory control (demand response and incident management are close approximations), and applying pricing schemes designed to move the product more cost effectively (deep discounts for transit riders and perhaps congestion pricing for carpoolers and vanpoolers). "

It would be great to tell you that when Houston looked at its transportation assets, our leaders decided to make better use of our assets by putting HOV lanes down the center of all freeways. As I have already told you, however, we worked our way into our current system.

After we looked at rail costs, and evaluated which heaven we wanted to enter, we realized we had already created a system that was bigger than most, more effective than many, and had gained popularity with Houstonians. Only then did we really begin to treasure the system.

Not only had we utilized the unused Houston freeway medians as an asset, and improved them, but we now began to see other ways to organize and manage our system so that our assets are even more productive.

I have mentioned that we increased vehicle occupancy by upping the number of passengers needed for peak hour travel on the HOV lane; we plan to do more of that. I have also touched on how management of occupancy levels is crucial to keeping the HOV lanes flowing rapidly so that we maintain our transit riders.

METRO has also taken a significant role in Houston's cooperative freeway incident management program, a major element of which is the Motorist Assistance Program or MAP. This is a particularly good example of the coordination of various public agencies and the private sector to manage our total assets for the good of the region. In this cooperative effort, METRO laid out the program and pays the salary of sheriff's deputies to drive the MAP vans. The Houston Car Dealers Association provides many of the vans that patrol the freeways. Houston Cellular provides free telephone air time for motorists to call in freeway incidents that are blocking travel. METRO police-with interagency agreements with state, county and various other cities-are also specially trained to control the clearance of incidents and accident investigation on the major freeways in the Houstonregion.

One of the most important ways that we are going to maximize our HOV lane assets is by employing intelligent vehicle highway systems (IVHS) management tactics. A number of projects are underway in the area.

Loop detectors and cameras-installed in the mid-1980s-are being updated to provide instant information about transitway and freeway traffic conditions. METRO and TxDOT are now installing similar systems on all the major transitways and freeways of Houston. These electronic aides will be run from a new central control facility.

The central control facility is another cooperative project of METRO, the TxDOT, the City of Houston, and Harris County. Personnel in the facility will monitor traffic on freeways and many major thoroughfares. A temporary traffic control center is currently in operation.

From the new center, we will oversee and adjust traffic on a real-time basis so police will be able to respond more quickly to incidents that slow traffic. This coordinated system is informally called the "Houston Intelligent Transportation System" or HITS.

At the same time, TxDOT is building a fiber optic network to link the freeway electronics to the central control facility. Included in this computerized transportation management system are loop detectors, closed circuit television, ramp metering signals, electronic message signs, and radio information to provide immediate information to drivers about traffic conditions ahead and possible alternative routes if problems develop.

We also have begun the preliminary stage of the federally-sponsored ***Smart Commuter*** IVHS operational test. METRO and TxDOT have divided that project into two components. In one component, we will provide

access to immediate traffic and transit information for a test group of drivers who commute from north Houston on Interstate 45 to downtown.

The second part of the ***Smart Commuter*** test will allow a selected group access to real-time ride matching information. Our plan is to provide computer linked information for west side commuters-headed for the Galleria, a huge "Edge City." Commuters will enter departure and destination information, then that information will be matched with someone who wants a ride to the same area. A meeting place will be arranged-say a park-and-ride lot-and "instant car-pools" will result.

Not necessarily related to the maximization of the HOV system, but an integral part of our total transportation asset management program, is our program to install smart intersections. METRO has begun a $120 million program to have our intersections "talk" to traffic lights, and have traffic lights talk to each other, and automatically adjust movements in traffic corridors and cross-corridors.

These new smart intersections will also relay that information to the computerized central control facility. We will have almost 600 intersections modified and functioning in the next two-and-one-half years. Some are already linked and operating together. TxDOT has a program similar to METRO's for the roadway traffic signals under its control. Together, the two agencies have some $500 million committed to these programs.

If we go back to Tad Widby's comparison of managing transportation assets like we would manage the assets of a manufacturing plant, you will remember that we have talked about using IVHS to make our product more efficient. We have talked about increasing vehicle occupancy requirements to both assure efficiency and to add the equivalent of a second shift by spreading the peak traffic. We have talked about a just-in-time inventory control equivalent, in the use of demand response transit as well as our cooperative incident clearing, our Motorist Assistance Patrols, and the coordination of all traffic from our new central control facility.

I will briefly mention that a pricing scheme designed to move the product cost-effectively comes in the form of the current free use of the HOV lane. Park-and-ride patrons, as well as carpool and vanpool patrons, receive the bonus of time, and faster movement when they use the HOV system. During the peak hours, traffic flows in the HOV lane at a much faster pace than in the freeway main lanes. For instance, on the 13 mile Katy HOV lane, METRO buses and carpoolers usually save 18 to 22 minutes per trip over the main lane drivers.

Another asset management technique we are examining is congestion pricing. We would like to test this concept first on an HOV lane that is under design right now. In this instance, we hope to sell unutilized capacity as long as that capacity is available without impeding the flow of overall traffic.

The other bonus for consumers with the decrease of single occupant vehicles is in the form of cleaner air. Automobiles are polluters and the Clean Air Act has fairly strong support among our citizens. The 1991 Clean Air Act Amendments openly call for increased vehicle occupancies. Houston, which is a Severe Non-Attainment area for ozone, is going to have to increase vehicle occupancies for workers by about 25 percent. That means cutting one-in-four single occupant vehicles each day of the work week.

Clearly these governmental mandates are powerful organizing principles. HOV lanes are perfectly situated to provide alternative ways to respond to these mandates. Also, the law passed by Congress last summer allowing up to $60 per month of discounted transit passes to be non-taxable, will clearly benefit HOV lanes in increased bus occupancy.

California's recently passed cash-out law requires employers of more than 50 employees who subsidize their employees' parking in leased space to offer the workers cash in lieu of parking. This is another governmental mandate that will indirectly increase the use of the HOV lane by carpools, vanpools, and buses.

As my final point, I would like to say that looking at the transportation infrastructure as a whole, rather than from the point of view of competing governmental agencies, is the key to this asset management program. Your city's transportation assets may be different from Houston's. HOV lanes may or may not be the most efficient use of the transportation rights-of-way in your city.

Examining your city's total transportation assets with clear eyes, devoid of territorial protection and with strong interagency cooperation, may yield new insights. That may be the most important system-wide solution of all.

The cooperative efforts of the various transportation agencies have been essential to evaluating the best use of the total transportation assets of Houston and Harris County, and have pointed Houston in the direction of HOV lanes as our organizing principle. In fact, cooperation is the basic ground on which we have constructed our little piece of HOV heaven.